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ON CONNOTATION AND ATTRIBUTE *

I

IN 1880, from the heights of Hampstead Heath, W. S. Jevons wrote: "To anyone desirous of acquiring a thorough command of logical science, nothing is so important as a careful study of the intensive or comprehensive meaning of terms. . . . This indeed is not an easy task," he continued, "as is shown by the fact that some of the great logicians who have written on the subject . . . have fallen into grave errors, or at the best fatal ambiguities of expression. Most of the common text-books . . . either ignore the subject altogether, or else treat it in a manner quite disproportioned to its difficulty and importance."[1] One might have thought that, with the enormous growth of logic in the years since 1880, much would have been written to remedy this situation. The fact is, however, that no "careful study of the intensive or comprehensive meaning of terms" has been undertaken without—so it seems—"grave errors" or "fatal ambiguities of expression." Mathematical logicians have for the most part ignored the subject altogether or have treated it in so superficial a way as not to have attracted philosophical interest. Closely related to these topics is of course the hoary subject of *connotation,* about which nothing very new or sound seems to have been written in recent years. The sad fact is that this important and fascinating area of logic seems almost wholly to have been neglected; yet no topic is of more importance for "anyone desirous of acquiring a thorough command of logical science" and of its applications to philosophy.

Let us explore briefly some influential historical views on this subject, before sketching what would appear to be a more adequate theory founded upon modern syntax and denotational semantics.

Strictly, of course, we shall do well to distinguish intension and

* Some of the material of this paper was presented before the Graduate Philosophy Club at Yale on October 29, 1963. The author wishes to express his thanks to Professors F. B. Fitch and Alan Anderson for some helpful comments.

[1] *Studies in Deductive Logic* (London: Macmillan, 1880), p. 126.

comprehension from connotation, although there are no doubt significant family resemblances, as we shall see.

One might hope to gain help on this thorny subject if one were to turn to the pages of the great *Oxford English Dictionary*. Under 'connotation' there, however, one finds discussion of no usage more recent than that of 1887, this in turn being essentially that of J. S. Mill. According to him, to connote is "to imply or indicate the attributes involved, while denoting (or being predicated of) the subject." Thus 'man' presumably *con*notes the attribute or characteristic of rationality whereas it *de*notes the specific human being Socrates.

Under 'intension' in the OED we find a rather similar discussion, confined solely to usage up to that of Jevons in 1876. An intension is said to be "the internal quantity or content of a notion or concept, the sum of the attributes contained in it; the number of qualities connoted by a term." But just what the "internal quantity" of a notion is seems not too clear. If it is the "sum of the attributes contained in" the notion, we may then ask: What is this sum? Some operation of logical summation is involved—is it not?—but as to the character of this operation, the OED, along with most writers on the subject, have maintained utter silence. Thirdly, the intension of a term is identified with "the number of qualities connoted by" the term. But this is clearly an absurdity, is it not? An intension is not a number, nor a subspecies of number, nor anything of the kind. By 'number' here no doubt is meant, again, *totality* or *sum*—the intension of a term is to be identified with the totality of qualities connoted by it. But this gets us no further, pending clarification of what these totalities are and of what kind of a relation that of connotation is supposed to be.

II

Two influential works, in part devoted to this subject, are Neville Keynes's *Formal Logic* [2] and Cohen and Nagel's *An Introduction to Logic and Scientific Method*.[3] Let us examine briefly the theories of connotation suggested in these before going on to sketch what would appear to be a more adequate theory.

[2] (London: Macmillan, 1906), p. 35 ff. This book, termed "excellent" by C. S. Peirce (*Collected Papers*, 3.384), has been called "the most perfect presentation of classical formal logic in general . . . [which] has been equally great and beneficent in its influence within Anglo-Saxon civilization" by Heinrich Scholz, in his *Concise History of Logic*, tr. by K. Liedecker (New York: Philosophical Library, 1961), p. 48.

[3] (New York: Harcourt, Brace, 1934), pp. 30–33.

The *extension* of a term, according to Keynes (22), "consists of objects of which the name can be predicated," whereas "its *intension* consists of properties which can be predicated of it," i.e., of the extension. Intensions are of three kinds, he notes: *conventional, subjective,* and *objective.* The conventional intension, or *connotation,* of a class-name consists of "those qualities which are essential to the class in the sense that the name implies them in its definition. Were any of this set of qualities absent the name would not be applicable." The subjective intension of a term depends upon the individual user of the term and is "less important from the logical standpoint."[4] Therefore we need say nothing more about it here.

Finally, "[there] is the sum-total of qualities [again, this notion of 'sum-total' crops up] actually possessed in common by all members of the class. These will include all the qualities included under the two preceding heads, and usually many others in addition." This sum-total comprises the objective intension (or comprehension) of the class-name. Perhaps a "sum-total" is a logical sum of classes. Or is it rather a *set*? Keynes is not too explicit on this point, although, as we have seen, the word 'set' creeps surreptitiously into his explanation of the meaning of 'connotation'. But a logical sum is not a set, and it is desirable here to know which is intended if we are to have a clear meaning for 'connotation' and 'objective intension'.

Keynes speaks of "classes" as, presumably, the objects designated by class-names. On the other hand, intensions are sum-totals or sets of "qualities." His ontology is thus at best rather mixed. It is doubtful that we need recognize *ab initio* a separate realm of attributes as distinguished from classes, for a clear condition under which two attributes may be said to be identical is lacking, as Quine and others have repeatedly pointed out.[5] Also the very notion of connotation here is not too clear. What are "those qualities which are essential to the class in the sense that the name implies them in its definition"? What is meant by 'essential' here? By 'implies'? Without detailed and acceptable answers to these questions, we cannot claim to have put forward a clear meaning of connotation at all.

It should be noted that Keynes is usually careful to distinguish between the use and mention of expressions, a care un-

[4] Compare, however, the author's *Intension and Decision* (Englewood Cliffs, N.J.: Prentice-Hall, 1963), chs. II–IV.

[5] See, e.g., *From a Logical Point of View* (Cambridge: Harvard University Press, 1953) and *Word and Object* (Cambridge, Mass.: The Technology Press; Wiley, 1960).

fortunately not shown by all writers on the subject. He vacillates, however, between speaking of class-names and of "properties" or "qualities" or "attributes" or "characteristics," as we have observed. Many of his statements concerning class-names seem acceptable on the basis of modern syntax and semantics. When he speaks of "attributes" or "characteristics," in the wake no doubt or Aristotelian essentialism, he seems less clear and not always defensible.

III

A very different kind of theory is suggested by Cohen and Nagel, although at first blush it seems rather similar to that of Keynes. In the first place, by a 'term' Cohen and Nagel do not understand an *expression,* but rather what the expression stands for. Propositions, they say, "either assert or deny something of something else. That about which the assertion is made is called the *subject,* and that which is asserted about the subject is called the *predicate.* The subject and the predicate [i.e., presumably the things, not the expressions] are called the *terms* of the proposition. . . . A term may be viewed in two ways," they continue, "either as a class of objects (which may have only one member) or as a set of attributes or characteristics which determine the objects. The first phase or aspect is called the *denotation* or *extension* of the term, while the second is called the *connotation* or *intension.*" Thus the extension of the term "philosopher" consists of Socrates, Plato, Thales, and the like; its intension consists of such "attributes" as *lover of wisdom, intelligent,* and so on.

It is interesting that Cohen and Nagel explicitly call the intension a *set* of attributes or characteristics. They are perhaps the first to recognize explicitly that intensions are sets in some fashion, and this recognition constitutes an important advance in the subject.

By the *conventional intension* or *connotation* of a term, Cohen and Nagel mean, more precisely, "the set of attributes which are essential to it." Thus the intension of the attribute P is presumably the set of all attributes Q essential to P. "And by 'essential'," they say, "we mean the necessary and sufficient condition [in the singular, notice] for regarding any object as an element of the term." This definition is not too clear. Perhaps, according to it, we may say that attribute Q is essential to attribute P if and only if necessarily every object that has P has Q and conversely. The intension of P then becomes the set of all attributes Q such that necessarily every object that has P has Q and conversely. But this is not the set intended, for presumably

it would be a set with only one member. Perhaps the intension of P is some other set, but precisely what or which we are not told.

It should be noted that this theory is given wholly within an object-language. For Keynes, however, the theory is meta-linguistic—more precisely, a part of semantics. It is not altogether clear what is thought to be gained by the object-linguistic formulation. Usually by a *term* one understands an expression of such and such a kind. Keynes is explicit on this point. According to him, "it seems better to start from the names. . . . Neglect to consider names in . . . connexion [with extension and intension] has been responsible for much confusion." Also Carnap, Church, and Frege have emphasized the importance of regarding intensions as intensions of expressions. In fact, it is now almost universally recognized that the theory of extension, denotation, connotation, intension, and the like, belongs to semantics, and hence is to be formulated within a semantical metalanguage.

There is also the difficulty concerning 'necessary', which is used fundamentally in Cohen and Nagel's theory, as we have noted. Is this to be construed in the sense of some modal operator? If so, we must then face squarely the need for mixing modal operators and quantifiers. There are grave difficulties here which must not be glossed over. Quine and others have pointed these out repeatedly. Surely we cannot expect a satisfactory formulation in the manner of Cohen and Nagel of a theory of connotation until these difficulties are overcome. Also closely connected with these is the rather doubtful ontology of attributes, etc., which we have already met in the formulations of Keynes. Further, the Cohen-and-Nagel kind of formulation appears to presuppose fragments at least of some kind of modal set theory, which, it is to be feared, has not been developed.

The reader may object that we are being excessively laborious as to logical detail. But, to borrow a phrase Cohen and Nagel themselves use in another context, "it is necessary to . . . [be] so if we wish to avoid elementary confusions." In trying to avoid such we must occasionally be allowed to refer to more advanced matters in modern logic, syntax, and semantics, as well as to pay strict attention to what might appear as minutiae. To refuse to allow this is often to refuse to let a subject grow or develop beyond its incipient (or textbook) stages. As logic itself, including now semantics, has developed enormously within recent years, it must carry its history along with it, subjecting it to fresh critical scrutiny in the light of present knowledge.[6]

[6] For a fuller discussion of the views of Keynes and Cohen and Nagel see the author's "On the Law of Inverse Variation of Extension and In-

IV

Let us reflect now a little upon what is needed if we are to gain what would appear to be a more acceptable theory of intension or connotation.

In the first place, we should wish to presuppose a well-articulated semantics including a syntax. Nothing less than this surely could now be regarded as satisfactory. Because connotation is so intimately connected with denotation or designation, the most natural logical underpinning is no doubt to be found in denotational or designational semantics.[7]

Next we should wish to provide a well-articulated notion of connotation or intension as such. One searches far and wide in the literature for this. In the author's *Intension and Decision,* a theory of many kinds of intension is put forward upon what appears to be a secure basis in syntax and designational semantics. Intensions there are handled in a very natural way as certain kinds of classes of classes. The semantical notion of *analytic truth* is presupposed. The theory there might be described as a first attempt to bring together the two historical lines of research on intensions. On the one hand there is the German tradition, stemming no doubt from Kant through Frege to Carnap. And, on the other, there is the English tradition to which Mill, Neville Keynes, and others have contributed notably. The crucial difference seems to be that in the German tradition intensions are usually regarded as in some sense indivisible wholes, whereas in the English tradition they are broken up into parts or components in some fashion. Behind both of these traditions is of course the long line of logical development back to Aristotle.

By the connotation of a class-term *a* let us mean, essentially as in *Intension and Decision,* the class of all classes *M* such that there is an expression *b,* designating *M,* in which *a* is analytically included (or subordinated). We use 'included' here now in the sense that a class-term *a* is analytically included in (or subordinated in) *b* provided the sentence consisting of a left parenthesis followed by an occurrence of a variable followed by a right parenthesis followed by a left parenthesis followed by *a* followed by an occurrence of that variable followed by the '$\supset$' (for the material conditional) followed by *b* followed by an occurrence of

tension,'' to appear in the *Proceedings of the XIIIth International Congress of Philosophy,* Mexico City, 1963.

[7] Cf. the author's *Truth and Denotation* (Chicago: University of Chicago Press, 1958), p. 104.

that variable followed by a right parenthesis,[8] is itself an analytic sentence of the object-language. Roughly speaking, the connotation of a is the class of all designated classes in which a is analytically included.

Let us consider now an example. Peirce remarks somewhere that logicians are so rooted in tradition that even their examples are usually borrowed from the classic writers. It is often thought that the newer logic including semantics is so remote from tradition, however, that the use of a classic example will help to remind us that this is not the case. Let 'rational' and 'animal' be primitive one-place predicates of some first-order language-system L, and let them designate respectively the class of rational beings and the class of animals. We then define 'man' as a one-place predicate in such a way that the sentence 'Each and every man is both rational and an animal' is analytic in L. 'Man', in other words, is regarded as short for the expression 'the class of all x's such that x is rational and x is an animal'. As members of the connotation of 'man' we have then the classes of rationals, of animals, and of men, together with any other designated classes in the designations or expressions for which 'man' is analytically included. Let 'featherless' and 'biped' be further one-place predicates, designating respectively the class of featherless beings and the class of bipeds. Although 'Each and every man is both featherless and a biped' is true in L, it is not analytically so. Hence the class of featherless beings and the class of bipeds cannot be members of the connotation of 'man'.

These few rough comments are by no means intended to provide a complete outline of a theory of connotation. They are merely a few suggestions that seem worthy of further development.

V

Let us reflect a little now upon the *relation* of connotation that emerges from this discussion. Many logicians, such as Keynes, speak of the connotation *of a term,* but do not strictly speak of connotation as a relation. But of course connotation and denotation are often spoken of in the same breath, and denotation is commonly regarded as a dyadic semantical relation between a class-term (or virtual-class term) and the several objects that fall under that class. We may well ask, then: What kind of a relation is *con*notation?

Clearly the first argument of the relation will be a term, more

[8] Note that we are merely spelling out here, or giving the *structural description* of, the given sentence.

specifically, a one-place predicate or class-constant. If we think of connotation as a *dyadic* relation, we may perhaps take the second argument as the connotation of the term in the sense just spoken of. To say then that a term *a* connotes a given class of classes is to say that that class of classes is the connotation of *a*. Perhaps it would be more apt to speak here of the *total* connotation of *a*, or to say that *a totally connotes* that class of classes.

But there are surely other uses of 'connotes' which we should wish to consider. Thus we often wish to say that 'man' connotes the property of rationality. But the property of rationality is not a class of classes, and hence this usage is not subsumable under the foregoing. We are avoiding here the ontology of attributes, qualities, properties-in-intension, and the like, in favor of that of the theory of classes as based essentially on Russell's theory of types. Hence we say here that the term 'man' connotes the class of rational beings. But the class of rational beings is the same class, is it not, as that of featherless bipeds? This seems strange, for men are only accidentally featherless bipeds, as we say, but essentially rational. Connotation is traditionally linked with so-called necessary properties, just as above it is linked with the notion of analytic truth.

Of course a rose by any other name is still a rose, and the class of featherless bipeds is the class of rational animals, no matter how we call it. Still, the name by which we call it seems important here, and should no doubt be brought in. If so, we suggest that this second relation of connotation should be regarded as *tri*adic, not dyadic. Let us say then that a class-term *a* connotes a class *M by means of* a term *b* if and only if *b* designates *M* and *a* is analytically included in *b*. Then no matter what we call *M*, the same class is connoted. But it is connoted *by means of* a specific term *b* in which *a* is analytically included. Thus, we say that 'man' connotes a given class *M* by means of the term 'rational' provided only that 'rational' designates *M* and that the sentence 'All men are rational' is analytic.

It is interesting to note that, for the semantical relation of designation, Carnap's principle of univocality holds:

> If *a* designates *M* and *a* designates *N*, then $M = N$.[9]

This principle fails of course for denotation, for we may well have, for some x and for some y, that *a* denotes x and *a* denotes y and it is not the case that $x = y$.

[9] Cf. *Meaning and Necessity* (Chicago: University of Chicago Press, 1946), p. 98.

For connotation in the first sense, clearly univocality holds:

> If a connotes the class of classes α as well as the class of classes β, then $\alpha = \beta$.

For connotation in the second, triadic sense, univocality holds with respect to the same b. Thus:

> If a connotes M by means of b and a connotes N by means of b, then $M = N$.

The reason is of course the univocality law for designation. What happens now if we vary the b? Clearly if a connotes M by b and also connotes M by c, then b and c designate the same class, but they need not be of the same syntactical shape and hence need not be identical. Further, if a connotes M by b and N by c, then nothing very interesting follows concerning M, N, b, or c (other than that M and N must overlap if a designates a class that is non-null).

It is worth noting that total connotation, the first sense distinguished, accords with Germanic theories of intension or connotation; the second, with English. In total connotation, what is connoted functions as an indivisible whole. In connotation in the English sense, various items are connoted severally.

VI

Having condemned above the introduction of attributes *ab initio* or as primitives, we may now reflect upon how to introduce them by definition *in usu*.

If the foregoing notion of connotation is sound, we might say that *an individual x has the attribute associated with the class-constant a* if and only if a is a class-constant and x is a member of *all* the classes that are members of the connotation of a. Note that this definition does not introduce variables for attributes and therewith commit us to assuming the existence of such. It provides rather a mere *manière de parler*. It does not enable us to speak of attributes *solo*, but only in a context in which both an individual x and a class-constant a are mentioned or referred to.

We note that x has the attribute associated with a if and only if x is a member of the *product* (in the sense of PM *40.01) of the class of classes that is the connotation of a.

The question arises whether such a notion of attribute is adequate to some intended purpose. (We shall speak of this in detail in a moment.) Also, a clear notion of attribute-identity must be given. This latter is immediately definable in terms of *analytical equivalence*. Thus the attribute associated with a may

be regarded as identical with the attribute associated with b if and only if a and b are analytically equivalent, i.e., if anly only if a is analytically included in b and b in a.

Identity of attributes as defined in this way, of course, introduces a second context in which we speak of attributes in addition to that above. But the two contexts are interrelated by two fundamental identity laws as follows:

> If a is a class constant, then the attribute associated with a is identical with the attribute associated with a.
>
> If the attribute associated with the class-constant a is identical with that associated with b, then for every x, x has the attribute associated with a if and only if x has the attribute associated with b.

It is well known that, from laws of this form, the usual laws concerning identity may be derived.[10]

Associated with every class-constant is one and only one attribute, although there may be two or more class-constants corresponding, so to speak, to it. In other words, the relation between class-constants and attributes, according to this conception, is many-one but not one-many. But analytically equivalent class-constants a and b have the same associated attribute.

The more usual way of construing attributes is rather different. According to Fitch's conception, for example, "corresponding to every attribute there is a class. The correspondence is such that, if a class C corresponds to an attribute A, then it is logically necessary that every member of C have the attribute A and that everything having the attribute A be a member of C. One class may correspond to several attributes, but more than one class cannot correspond to an attribute. In fact, if two attributes are logically equivalent in the sense that it is a necessity of logic that they apply to exactly the same things, then only one class corresponds to these two attributes."[11] Clearly, for Fitch, attributes correspond to classes, not to class-constants. Further, they are accommodated in an object-language, not within a semantical metalanguage as here. Fitch uses the modal notion 'necessary' rather than the semantical notion of analytic truth. The correlation between class and attribute is a one-many but not a many-one relation, whereas that between class-constants and attributes is in effect many-one but not one-many, as we have noted. Fitch speaks of

[10] Cf. D. Hilbert and P. Bernays, *Grundlagen der Mathematik*, vol. 1 (Berlin: Springer, 1934), p. 164 ff.

[11] F. B. Fitch, "Attribute and Class," in *Philosophic Thought in France and the United States*, ed. Marvin Farber (Buffalo: University of Buffalo Publications in Philosophy, 1950), pp. 545–563.

logically equivalent attributes, where here we speak of identical attributes in the sense that their corresponding class-constants are analytically equivalent. But the two relations are no doubt conceptually very similar.

Fitch requires that the correspondence between a class C and an attribute A be such that it is "logically necessary" that every member of C have the attribute A and conversely. This is a very strong requirement. In the procedure here, in terms of connotation, we have merely the logical equivalence that, if a class-constant a designates a class M, then every x which is a member of M has the attribute associated with a and conversely. Of course a kind of "logical necessity" is involved in this principle, that associated with a so-called formal equivalence, but it is not strictly the necessity of a modal operator. The stronger kind of requirement, that of Fitch, could be stated here only in terms of the notion of being analytically true *in the appropriate semantical metalanguage.* It is not clear that this stronger requirement is indispensable, however.

Fitch's notion is related to that of Russell, who introduces classes in terms ultimately of variables ranging over "propositional functions." For Russell, "the characteristics of a class are that it consists of all the terms satisfying some propositional function, so that every propositional function determines a class, and two functions which are formally equivalent (i.e. such that whenever either is true, the other is also) determine the same class, while conversely two functions which determine the same class are formally equivalent. . . . The incomplete symbols which take the place of classes serve the purpose of technically providing something identical in the case of two functions having the same extension." [12] In a somewhat similar way, Fitch regards classes as a special kind of attribute, "class-attributes," as he calls them. The method sketched above in terms of connotation, however, is rather the converse, in which attributes are regarded as a special kind of class, but introducible of course only in the semantical metalanguage.

VII

We must return to the question of adequacy. It is usually a difficult matter to establish that a theory is adequate to some intended purpose. Instead we usually show in a rough way that such and such desirable properties or statements hold or obtain in the theory. In the case of attributes, we must be sure that,

[12] A. N. Whitehead and B. Russell, *Principia Mathematica*, vol. 1, 2nd ed. (Cambridge: Cambridge University Press, 1935), p. 187.

in the suitable kind of context, such terms as 'unicorn' and 'centaur', for example, are properly differentiated. More specifically, let these words be class-constants for the moment. Although they denote the same objects (in particular, none at all), the attributes associated with them must clearly differ. Let us consider now whether this is the case in the theory suggested. The connotation of 'unicorn' is, we recall, the class of all classes designated by class-constants in which 'unicorn' is *analytically* contained or subsumed. Among such classes is presumably the class of unicorns itself, the class of one-horned creatures, the class of ferocious creatures, the class of creatures with the body of a horse and the head of a deer, the feet of an elephant, the tail of a boar, and with a deep, bellowing voice, and so on.[13] Of course much depends here upon the notion of analytic truth for the language at hand—but we are assuming that 'unicorn' is a class-constant defined in such a way that it is analytically subsumed in class-constants designating these various classes. Now, let 'centaur' be a class-constant defined by the phrase 'creature whose upper half is of the form of a man and whose lower half is that of a horse'. Clearly the connotata of the two constants 'unicorn' and 'centaur' then differ remarkably, even though they denote the same objects or designate the same class. (The class of ferocious creatures, to give just one example, is a member of the connotation of 'unicorn' but not of that of 'centaur'.) Of course much depends upon the given definitions and hence upon what is taken as analytic in the language at hand. For a fuller discussion, we should have to look at the logical structure of the language *from close to.*

We may presuppose in the object-language some simple theory of time-flow and hence that some of the atomic sentential forms admitted contain a time-parameter. Then the class of people now alive, for example, would be handled as the class of people alive at t for suitable t. Hence there need be no danger of assigning the attribute associated with 'people now alive' to, say, George Washington. But he would properly be assigned the attribute 'people alive in 1776'.

VIII

Let us review now the advantages if any that attend the mode of treating attributes suggested. In the first place, we try always to be clear here in distinguishing between the use and mention of expressions. Some writers on connotation, attributes, and the like have not always been thus clear, for example, Russell in the passage cited. Secondly, attributes, essential properties, and the

[13] Authority for these attributions is to be found in Bulfinch's *Mythology.*

like, usually occur as values for variables within some object-language. Here they are treated wholly within a semantical metalanguage containing a notion of analytic truth. Surely there is close interconnection between the modern notion of analytic truth and what traditionally has been regarded as necessary truth. The mode of treatment suggested here tries to bring out this relationship explicitly; to neglect to do so would be to miss important interconnections. Syntax and semantics are needed anyhow for multifarious philosophical purposes, and, if they can be made to do the work ordinarily achieved by attributes and the like, this would seem all to the good. Thirdly, the alternative mode of treatment employs notions of modal logic and a modal set theory based on it, which are at least controversial and whose legitimacy is questionable. Perhaps at bottom modal logic involves a confusion of use and mention by attempting to locate in an object-language what more properly belongs to a semantical metalanguage—*the fallacy of misplaced location,* let us call it. Strictly speaking, only *sentences* are analytic, whereas modal logic must assume *ab initio* not only sentences but a host of *propositions* as new entities together with special operators upon them, those of necessity, possibility, and the like.[14] And further, a set theory based upon modal logic would be complicated indeed. It is not clear that such a theory has ever been fully formulated. At any event, it is clearly not needed in mathematics, where set theory seems properly to belong.

In building up connotations, attributes, and in general a great variety of kinds of intension, from a foundation in the theory of denotation, extension, and the like, we are of course inverting the usual order. It has usually been assumed that extensions such as classes are in some fashion a special case of intensions. It must be confessed, however, that intensions have always been a bit foggy. In taking them as the fundamental kind of entity, the whole edifice of logic has rested upon at best dubious and questionable entities and assumptions. By contrast, the notion of class is clearer. In founding connotation theory and the theory of attributes on class-theory within a suitable denotational semantics, we have a clear-cut kind of foundation less dubious and questionable. Not that we have yet philosophically plumbed the full depths of the notion of class—quite the contrary. But there is hope here, and hence hope too for connotations and attributes construed in their light.

[14] Cf. the author's "Does Modal Logic Rest upon a Mistake?", *Philosophical Studies,* **14** (1963): 8–11, and "On Maximum Logical Candor and Extensionality," *Synthese,* **15** (1963): 283–291.

To summarize: Modern semantics conveniently divides into two parts: the theory of extension or denotation and that of intension or connotation. The former has been the object of intensive development in recent years, whereas the latter has been for the most part neglected. Precisely how are these two areas of theory interrelated? Some logicians, e.g., Carnap, Fitch, and Russell, have urged that intensions, including connotations and attributes, are in some sense more fundamental than extensions, and therefore that the theory of the extension is in some sense derivative. The point of view urged in this paper is just the reverse. It is maintained that the theory of intensions may be regarded as a branch of the theory of extension. The notion of analytic truth for the given object-language must be presupposed, and a theory of connotations and of attributes may then be built up in terms of it.

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RESCHER ON ARABIC LOGIC

THE attention given to logic in the twentieth century could not but result in an increase in the study of its history. Indicative of this interest are the recent works of Kneale and Kneale and of Bocheński.[1] Although both these works are excellent in many respects, they omit any significant reference to the logical activities of the Arabic-writing logicians, who, after all, were an important part of the Western logical tradition. This omission has been somewhat compensated by two new books by Nicholas Rescher,* and will, we hope, be completely filled by his forthcoming history of Arabic logic. Slowly, but gradually, we are becoming aware of the vast, variegated, and valuable philosophical tradition of the Moslems and Jews, especially in the Middle Ages.

The first of these works, *Studies in Arabic Logic,* is a short collection of brief essays on various logical topics as treated by the Arabic logicians. We might at the outset settle a terminological point: Rescher's use of the phrases 'Arabic logic', 'Arabic logician' warrants attention. Rescher refers not only to Moslem

* *Studies in the History of Arabic Logic.* Pittsburgh, Pa.; Univ. of Pittsburgh Press, 1963. 108 p., $3.50.

Short Commentary on Aristotle's Prior Analytics. Al-Farabi. Translated, with introduction and notes, by Nicholas Rescher. Pittsburgh, Pa.: Univ. of Pittsburgh Press, 1963. 132 p. $3.00.

[1] William and Martha Kneale, *The Development of Logic* (Oxford: Clarendon Press, 1962); I. M. Bocheński, *The History of Formal Logic* (South Bend, Ind.: Notre Dame Univ. Press, 1961).

philosophers such as Averroes and Avicenna, but to the Arab Christian logicians as well. Indeed, he traces for us the chain of logical tradition and transmission from the Hellenistic and Alexandrian Greeks through the Syrian Nestorians to the Arab and Persian Moslem logicians. However, to be consistent one should include as well the Jewish logician, Maimonides, who also wrote in Arabic. In the brief sketch of the history of Arabic logic given in this book, no mention is made of Maimonides' *Treatise on Logic,* although there is a footnote appended to one of the other essays acknowledging its existence. It is hoped that in Rescher's full-length history of Arabic logic this omission will be rectified.

This leads us to a more general point about the essays in this collection: they are of varying interest and value. About half of them are mainly historical and textual in nature, among these —Rescher's account of Arabic logic, a summary of Al-Farabi's treatise on the history of philosophy and of logic, and an introduction to and translation of Al-Kindi's (805–873) sketch of Aristotle's Organon. These three essays are the most interesting and valuable of the textual-historical group, but their value is still limited. The first is *too* brief; the second repeats some of the material of first essay; and the third raises questions as much as it solves them. From the latter work we do learn of the traditional Alexandrian didactic arrangement of the Organon, in which the *Categories* were taught first and the *Poetics* last. Rescher also tells us that this arrangement is ordered according to decreasing logical rigor: from the valid syllogisms of the *Analytics* through the dialectical syllogisms of the *Topics* to the fallacious arguments of the *Sophistical Refutations.*

However, it is puzzling to see the *Poetics* included in the Organon. Rescher tells us that this tradition dates from Simplicius (c. 533), but he does not indicate, or even suggest, why this tradition came about or how it was justified. Some information on this topic can be gleaned from Rescher's book, but it is not to be found in his own words. In his translation of Al-Khwarizmi's *Chapter on Logic,* we do see how some of the Arabic logicians were bothered by this practice. Al-Khwarizmi treats *mimesis* as a type of knowledge, having logical and epistemological interest. Nevertheless, the reasons why Simplicius and his successors included the *Poetics* in the Organon are still not clear to us. Besides not helping us in this matter, Rescher also fails to cite any material that might clarify the issue—e.g., Richard Walzer's essay on this topic [2] which has been recently reprinted in a collection of his

[2] "Zur Traditionsgeschichte der Aristotelischen Poetik," in *Greek into Arabic* (Cambridge, Mass.: Harvard Univ. Press, 1962).

studies in Islamic philosophy. According to Walzer, this tradition goes back to Olympiodoros (490–560).

The important facts that emerge from Rescher's historical sketches can be summarized as follows: Arabic logic had its beginnings when the Syriac Christians translated the first four books of the Organon (*Isagogue, Categories, De Interpretatione, Prior Analytics*) from Greek into Syriac. These four were the only books of the Organon translated into either Syriac or Arabic before the middle of the ninth century. Translations into Arabic began in the ninth century, and were done by Christians. The center of Arabic logical studies was in the East; Baghdad was the first main place of study, followed by Persia. Although the originators and leaders of the former school were Christians, ultimately the school was led by a Moslem, Al-Farabi (870–950), whose fame as a logician is evidenced by Maimonides' insistence that Al-Farabi alone is worthy of study among the modern logicians (*Letter to Samuel ibn Tibbon*). The chief achievements of the Baghdad school were three: (1) the complete translation of the Organon into Arabic; (2) commentaries on various books of the Organon, among which those of Al-Farabi are of especial importance; and (3) the study of extra-Aristotelian logical topics, such as the conditional syllogism and analogical inference. As a result of political and theological harassment, the school died out, and Persia became the center of logical study under the leadership of the famous Moslem philosopher Avicenna (980–1037). Avicenna's approach to logic was less committed to devotion to the text of Aristotle, the study of which was becoming more hazardous in Persia. And the logical tradition in Persia was supplemented by material from Galen and the Stoic logicians, especially the Stoics' work on conditional syllogisms and propositions. Eventually, logical studies spread westward to Arabic-speaking Spain and reached their highest development in Averroes (1126–1198). This tradition, however, also died out as a result of religious-political persecution and of sterile techniques of instruction.

In addition to studies in the history of Arabic logic, Rescher includes a number of essays in which the logical achievements of these philosophers are analyzed and assessed. The essays on Al-Farabi's discussions of existence as a predicate and of future contingencies, Avicenna's treatment of conditional propositions, and Averroes' discussion of assertoric propositions are of special interest.

The issue of existence as a predicate in Arabic logic did not arise out of the ontological argument for the existence of God.

Indeed, this argument played only a minor role in the Judaeo-Islamic tradition, if any at all. It is an interesting and yet unsolved problem why this proof did not present itself to these philosophers. They were concerned, however, with the general relationship between *essence* and *existence,* and this problem naturally led to the question of whether existence is a genuine predicate. Rescher maintains that the motives for this inquiry were purely logical, growing out of Aristotle's discussion of the problem in his *Posterior Analytics* 92^b3–18. Although Rescher is right in rejecting the ontological argument as relevant here, he is wrong in construing this problem as a purely logical one. For the Arabic philosopher, the issue was equally metaphysical, particularly with reference to the question of God's simplicity. For in God, it was maintained, essence and existence are identical; therefore, no attributes, essential or accidental, can be admitted.[3]

Al-Farabi's answer to this question is a contextual one: Regarded from the point of view of the scientist, 'exists' is not a genuine predicate, since "the existence of a thing is nothing but the thing itself," nothing being conveyed by this term such that our knowledge of the essential nature of the thing is increased. For the scientist, the predicate must give knowledge of the essential nature of the thing. On the other hand, regarded from the logicians point of view, 'exists' is a genuine predicate, since any proposition having the form 'x exists' is true or false.

As indicated above, Rescher traces Al-Farabi's discussion back to Aristotle's remarks in the *Posterior Analytics* 92^b3–18. In this passage, Aristotle is beset with the following problem: To know the nature of anything implies that we know that there is something exemplifying this nature. On the other hand, definition does not provide proof that something satisfying the definition does in fact exist; for "what human nature is and the fact that man exists are not the same thing." Moreover, being is not the essence of anything, since it is neither a genus (cf. *Metaphysics* 998^b17–24, 1045^a34–68) nor an essential attribute (*Metaphysics* 1045^a2). Elsewhere, however, Aristotle does say that being *is* a predicate (*Metaphysics,* 1053^b17–21). In the face of these ambiguities and apparent inconsistencies, Rescher claims that Al-Farabi's answer is an attempt to accommodate *all* the aspects of Aristotle's discussion of this issue.[4]

[3] Compare Maimonides' discussion of this issue in his *Guide to the Perplexed* (New York: Dover, 1956 edition: Part I, Chapters 51, 52); cf. also Harry Austryn Wolfson, *The Philosophy of Spinoza* (New York: Meridian, 1960), pp. 121–125.

[4] Compare Maimonides, I, 60; also H. W. Joseph, *Introduction to Logic* (Oxford: Clarendon Press, 1957), p. 169.

Al-Farabi's answer might have been further clarified if Rescher had mentioned Aristotle's distinction between essential natures, or real definitions, and verbal, or nominal, definitions (*Posterior Analytics,* $92^{b}26$). Knowledge of essential natures requires that there exist individuals exemplifying these natures. However, such natures, or real definitions, do not state that there exist such individuals. Thus to say that D's exist is neither tautologous, for 'exists' is not part of the definition (real or nominal) of D, nor superfluous, since 'D's exist' is crucial in determining whether we can attain a real definition of D. For this reason, some philosophers have been led to say that 'exists' is a "logical" predicate: 'exists' appears in true or false—and therefore significant—statements, which have a use (footnote 11, p. 41). However, these philosophers have been misled by the subject-predicate analysis of propositions. For 'D's exist' is not in subject-predicate form; therefore, there is no need to say that 'exists' is a predicate, "logical" or otherwise.

The next great Arabic logician was Avicenna; and he is represented in this collection by a paper on his analysis of *conditional propositions.* In this category the Arabic logicians included *hypothetical* and *disjunctive* propositions; but in the latter case, the disjunctive operator is *exclusive.*

Rescher notes that these distributions have their roots in Stoic logic and are paralleled in Boethius' *De Syllogismo Hypothetico,* which, together with most of Latin literature, was not available to the Arabs. The interesting feature of this analysis is the introduction of "quality" and "quantity." Hypothetical and disjunctive propositions can as wholes be both affirmed or denied and temporally quantified. In the case of a hypothetical proposition, then, we have the following cases with respect to quality: affirmative—'If A then C'; negative—'Not: If A, then C'. And with respect to quantity, we have 'Always: when A then C'; and 'Sometimes: when A then C' (their corresponding negations already admitted). As Benson Mates and others have shown, temporal quantification is Stoic in origin, in particular in the logical work of Diodorus of Cronus. Avicenna generalized Diodorus's analysis—which was limited to universal propositions—by combining it with the *quality* of propositions, thereby obtaining, in the case of the hypothetical proposition, a fourfold schedule of propositions analogous in form to the modern quantification of the Aristotelian categorical propositions. However, here quantification is over situations, or cases—'(t)' and '$(\exists t)$'—rather than over things or individuals.

Another example of the use of temporal quantification in

Arabic logic is to be found in Averroes' discussion of *assertoric propositions,* which is translated here from the Latin and annotated by Rescher. As far back as the early commentators on Aristotle, attempts were made to reformulate modal propositions as categorical propositions extensionally quantified with respect to time. Also embedded in this issue is the question whether to treat *assertoric propositions* as modally neutral or as propositions in the modality of possibility. Averroes gives an interesting and historically useful account of two divergent traditions within Aristotelian logic as to the correct interpretation of Aristotle on this topic: the schools of Theophrastus and of Alexander of Aphrodesias, the former construing assertoric propositions as modally neutral, the latter as possible propositions. Averroes' own view is as follows. Assertoric propositions of the form 'the *S*'s are (actually) *P*'s' are given a modally neutral temporal analysis such that three different cases are distinguished: *mostly assertoric*—For the majority of times *t:* all *S*-at-*t* is *P*-at-*t; equally assertoric*—For as many times *t* as not: all *S*-at-*t* is *P*-at-*t; leastly assertoric*—For the minority of times *t:* all *S*-at-*t* is *P*-at-*t*. On the other hand, Averroes gives the modality of possibility both a temporal and a nontemporal construction, such that, in the case of the *mostly possible,* for example, we have on the former interpretation 'For the majority of times *t:* Some *S*-at-*t* is *P*-at-*t'; and* on the latter interpretation 'most *S*'s are *P*'s'. According to Rescher, Averroes prefers the nontemporal interpretation (note 46, p. 99).

Both Avicenna's and Averroes' discussions are historically and logically interesting in illustrating the late ancient and medieval attempt to translate modal propositions into extensionally equivalent nonmodal propositions. This procedure has been recently revived by such logicians as Arthur Prior in his *Time and Modality.* The perennial character of this issue suggests that Aristotle's treatment of modality was not considered the last word even by his pupils, and that they were also dissatisfied with the intensional notions of necessity and possibility. The reasons and motives for this dissatisfaction, however, are not altogether clear; and in this essay, at least, Rescher does not indicate whether logical, metaphysical, or religious motives were involved. At any rate, our present concern with modal logic is not novel; and it is more than just historically interesting to see how these problems were handled by some first-rate logicians of the past.

Perhaps the essay on future contingencies will be of most interest to contemporary philosophers. In this essay, Rescher presents both Al-Farabi's interpretation of Chapter 9 in *De Interpretatione* (hereafter abbreviated as DI) and as part of his defense

of Al-Farabi's interpretation a new translation of and running commentary on what he considers to be the crucial passage, 19^a18–19^b4 (the Al-Farabian position accords with that of a number of recent commentators, such as Anscombe, Butler, Hintikka, and Strang). Basic to Rescher's presentation and defense of Al-Farabi's interpretation of DI9 is the distinction between two sets of principles: (1) a: $N[T(p) \vee F(p)]$, b: $N[T(p) \vee T(\bar{p})]$; and (2) a: $N[T(p)] \vee N[F(p)]$, b: $N(\bar{p}) \vee N(p)$, c: $N[T(p)] \vee N[T(\bar{p})]$ (where 'N' is the modal operator 'it is necessary that'). According to one interpretation, which goes back to the Stoics, Aristotle placed a restriction upon the first set of principles—which we now call the Principle of Bivalence and the Principle of the Excluded Middle—thereby excluding statements in the future tense. On this interpretation, principles 1a and 1b are not universally applicable, and future statements fall into a "truth-status limbo." Otherwise, Aristotle would have to accept fatalism, a view which he finds repugnant and rejects in other contexts.

But the Al-Farabian position, which in the Middle Ages was paralleled in the Latin tradition by Abelard, Aquinas, Ockham, *et alia,* places the restriction upon the second set of principles: future contingencies are not governed by the latter set. In this way, fatalism can be rejected, and yet the principles of Bivalence and the Excluded Middle are preserved and given full applicability. Thus, on this interpretation, future contingencies are not exceptions to the latter principles, which for Aristotle, then, have wider application than the former set of principles. For the second set of principles are applicable only to sentences in the past or present tense. This interpretation, Rescher suggests, accommodates not only Aristotle's rejection of fatalism, but also the Biblical-Koranic insistence upon God's foreknowledge of future contingencies. For if statements about the future are neither true nor false, then how can God know them? This was not a problem for the Stoics; accordingly, they were prepared to accept fatalism.

Rescher's justification for giving us a new translation and commentary of one of the passages in DI9 is his claim that many of the standard English translations embody the Stoic interpretation of Aristotle, for example, the Oxford translation of E. H. Edgehill and the Loeb translation of H. P. Cooke. In 19^b1–2, for example, we see this quite clearly. The Oxford translation reads: "It is therefore plain that it is not necessary that of an affirmation and a denial one should be true and the other false." This reading restricts the applicability of the first set of principles. The Arabic translation of DI9 used by Al-Farabi, however, reads: "It is clear by this that not every (contradictory) affirmation and denial is such that one of the two is true *by necessity* and the

other false *by necessity*'' (my italics). This reading restricts the applicability of the second set of principles. Future statements are neither true by necessity nor false by necessity; but they are necessarily true or false.[5] Thus, the Principles of Bivalence and Excluded Middle are retained as logically prior, fatalism is rejected, and God's foreknowledge of future events is allowed.

It must be admitted, however, that Rescher's translation of 19^a 18–19^b4, although perhaps clearer in certain respects, is in general almost identical with those of Edgehill and Cooke. Even in the controversial passage 19^b1–2, Rescher's translation does not differ in essentials from Edgehill's or Cooke's.[6] It is his commentary on this section that presents the Al-Farabian view. Throughout this commentary Rescher consistently interprets the Greek phrases *'ouk anagke'* and *'ex anagkes'* as connoting necessary truth or falsehood. Thus, Rescher's commentary on 19^b1–2 reflects the Arabic translation used by Al-Farabi. According to this interpretation not all contradictorily opposed affirmations and denials are necessarily true or necessarily false; exceptions are statements in the future tense. Aristotle, then, restricts the second set of principles previously cited, not the Principles of Bivalence and Excluded Middle.

Rescher's second new contribution to our knowledge of Arabic logic is a translation of Al-Farabi's *Short Commentary on Aristotle's* Prior Analytics. As Rescher points out, the *Short Commentary* was one of three types of commentary written in the Middle Ages on the Aristotelian corpus; however, the short commentary is more a *summary* of an Aristotelian text than a commentary upon it. In addition to the translation, Rescher also appends an introduction which, although duplicating some of the material in the historical essays in the former work, contains some valuable information. Most useful are a list of Al-Farabi's logical works in all extant editions, a list of Syriac and Arabic translations of the *Prior Analytics,* and a comparison of Al-Farabi's ''commentary'' with the Aristotelian text, pointing out those topics which Al-Farabi found worth while and those he did not. Two major concerns of Aristotle evidently did not strike Al-Farabi as needing comment, at least in this work: the theory of the categorical syllogism, which he probably felt had been well taken care of by Aristotle himself, and the theory of the modal syllogism,

[5] Rescher notes that Edgehill's over-all translation reflects the Al-Farabian interpretation (cf. Edgehill's analytical table of contents); and he understandably finds Edgehill's translation of 19^b1-2 ''incomprehensible.''

[6] ''It is thus plainly not the case with all contradictorily opposed affirmations and denials that it is necessary that one be true and the other false.''

which apparently was not studied too much by the Syriac logicians. Al-Farabi did elaborate this theory in his longer commentary, which was a book for the advanced student, whereas the short commentary was probably for beginners and theologians. Rescher maintains that Al-Farabi concerned himself with those topics in the *Prior Analytics* which Aristotle only touched upon briefly. Among these the theory of the conditional syllogism and induction are of chief importance.

Like Avicenna's analysis of conditional propositions, Al-Farabi's discussion of conditional syllogisms includes both hypothetical and disjunctive syllogisms; again, disjunctive propositions and syllogisms are interpreted as *exclusive* disjunction. However, Al-Farabi's notion of a hypothetical proposition is not unambiguously truth-functional. This can be seen in Al-Farabi's definition of a hypothetical proposition; hypothetical statements "maintain a conjoining of one thing with another . . . for this particle (viz. 'if') and others like it such as 'when' and 'whenever', makes (the consequent) dependent upon the connection with it (the antecedent)" (p. 53). It may be that I am putting too much stress upon the words 'dependent' and 'connection', that I am arbitrarily construing these words in a non-truth-functional manner. But I get the impression that, for Al-Farabi, hypothetical propositions assert causal connections, or at least the antecedent and consequent are in some sense mutually relevant. As additional evidence for this claim, all of Al-Farabi's examples are sentences whose consequents are significantly related to their antecedents. ("If the world is originated, then it has a creator," "If the sun has not risen, then it is not day"). There is no evidence, at least none supplied by Rescher, that Al-Farabi or even Avicenna recognized *material* implication. This is all the more interesting since, according to Rescher, both philosophers were influenced by Stoic logicians, *some* of whom did recognize material implication as a distinct logical operator. Apparently Al-Farabi and Avicenna were not influenced by those who did. At any rate, the truth-functional character of hypothetical propositions is not at all clear in Al-Farabi.

Al-Farabi's discussion of problems in inductive logic constitutes a real expansion of Aristotle's remarks on this subject in the *Prior Analytics,* or for that matter anywhere else in the Organon. This analysis is concerned with a number of different but related issues in inductive logic, especially analogical reasoning. Before discussing analogy, Al-Farabi makes some general remarks about induction, concluding on an ambivalent note. The ambivalence is manifested in his reduction of various types of correct inductive

arguments to valid syllogisms, suggesting thereby that correct induction is just deduction. This tendency is evident even in the type of inductive argument that Al-Farabi finds particularly interesting, *analogical reasoning,* or "transfer." In Aristotle we find this type of induction mentioned only briefly (*Topics* 108^{b}10–14); hence Al-Farabi's discussion is valuable if only to see what can be done with the hint Aristotle provides. What emerges from his treatment is a kind of "logic of analogical reasoning," quite similar to what one finds in some contemporary introductory logic textbooks.[7] Al-Farabi insists upon the *relevance* in the analogy. But to be able to assert such relevance is to possess some universal proposition, which turns the analogical argument into a *deductive* argument. Again we see how, for Al-Farabi, "correct" pieces of analogical reasoning are actually *valid* syllogisms of the form AAA-1; inversely, if one cannot turn an analogical argument into a deductive argument, the former is not correct (p. 95, Rescher's note is helpful). One wonders, then, whether Al-Farabi recognizes analogical reasoning, indeed inductive reasoning in general, as an autonomous type of argument.

I must confess that I find this whole section of Al-Farabi's epitome difficult and, indeed, in parts just plain obscure. Rescher's interpolations into the text are more than just helpful; they are often necessary for the comprehension of Al-Farabi's sentences. Moreover, Rescher's notes are frequently essential, since Al-Farabi's terminology is sometimes strange. A good example of the value of Rescher's notes for the understanding of Al-Farabi's language is Al-Farabi's discussion of how one establishes universal propositions by "raising" and "finding." These two ordinary terms are used in a technical sense to connote denying and affirming respectively.[8]

Rescher believes that Al-Farabi is presenting here the outlines of a new method for establishing empirical generalizations, which is unparalleled before Bacon (p. 44). But upon examination this "method" turns out to be nothing more than the application to empirical arguments of certain rules of deduction, such as *modus ponens* and *modus tollens.* For example, if we want to establish 'All agents are corporeal', we first determine whether, for every x, 'if not-Cx, then not-Ax' is true. If this condition is satisfied, then

[7] For example, I. Copi, *Introduction to Logic* (New York: Macmillan, 1961), chapter 11.

[8] In Rescher's note on p. 103 there seems to be a misprint. The note reads as follows: "By 'finding' is meant the opposite, namely 'to assume to be present' (in the case of a quality) or 'to assume to be false' (in the case of a judgment)." But the word 'false' cannot be right, if "finding" is the opposite of "raising."

'All A is C' is true. Clearly, however, this is an example of the use of transposition, or contraposition, which was already known to Aristotle. Even the "joint method of raising and finding," which Rescher believes to be a prototype of later theories of induction, is just the realization that coextensive predicates permit conversion. Moreover, it is not at all obvious that Al-Farabi's discussion is concerned with causal reasoning, as Mill's methods are. In the concluding paragraph of this section, Al-Farabi does talk of causes, but for the first time and only briefly. And his view is that convertible predicates do *not* imply a causal relation (p. 108). In the light of these considerations, it is somewhat anachronous to describe Al-Farabi's procedure here in such a way as to suggest that Al-Farabi was a precursor not only of Bacon but of Mill as well.

Rescher's work in the field of Arabic logic and, in particular, on Al-Farabi is a good sign that philosophers and logicians are still interested in the histories of their subjects. Moreover, it is a good thing that we find people doing historical work who are trained in modern philosophical and logical techniques. It is with high hopes that we await Rescher's forthcoming *Development of Arabic Logic;* these two briefer works have whetted our appetite.

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BOOK REVIEW

Language, Meaning, and Persons. NIKUNJA VIHARI BANERJEE. New York: Humanities Press, 1963. 173 p. $5.

This is an ambitious book which aims at establishing philosophy as an autonomous discipline; this status it surely deserves, but has not yet attained, in spite of being as old as human civilization. Philosophy, Prof. Banerjee believes, must be strictly anthropocentric, concerned with the question of man and his liberation, and, in his opinion, most of what goes by the name of philosophy is not philosophy at all.

The problem of human liberation, however, is not an entirely new problem; traditionally, it has been treated as the philosophical problem par excellence by Indian thinkers. But there is a difference between the traditional Indian approach and that taken by Banerjee. Indian thinkers of old believed that liberation was to be attained by an individual as an individual, by seeking to realize himself as consciousness or self (as distinct from a material object with which he normally confuses himself) through the

control and even eradication of all passions and desires, which make man a slave to the material realm. Liberation here is an individual goal, whereas Banerjee believes that individuality is an illusion and that liberation comes only when one realizes that one is essentially integrated with others in the realm of the personal; Banerjee nowhere links the concept of person with that of consciousness or self and certainly not with uniqueness.

The realm of the personal, or the concept of "I with others" which is contrasted with "I and others," is the most fundamental category of thought that philosophical vision reveals, and an awareness of this Banerjee calls "transcendental awareness." This is what is presupposed in all knowledge whether we know it or not. This conception is similar to Kant's "transcendental unity of apperception" with this difference: Kant affirmed that object-knowledge is impossible unless we presuppose a unitary knower who binds, as it were, successive perceptions of an object into a unitary whole of experience. But nothing more is known of this subject than that there is a subject to give experience the character it has.

Banerjee's "transcendental awareness" goes beyond this bare unity of a subject, for according to him it is not just the "I," a unitary subject, that is presupposed, but the whole realm of the personal. As there is no solitary "I," what is presupposed is the "we," and this "we" is not merely "I and others" but "I with others." The use of 'we' means that individuals are essential to one another who have no reality without their basis in this essentiality. We falsely believe the "I" to be the ultimate datum because our biological birth predisposes us to insularity and egoity.

Banerjee ties up this "we," the realm of the personal, with a theory of imagination, a theory of time, and a theory of meaning, all deriving their significance not from "I and others" but from "I with others." Human beings are in time, and time is a triad, past-present-future. Perceptual knowledge is concerned with the present, memory with the past, and imagination with the future. Past and present have a content, and this content is spatial, whereas the future has no content that can be perceived or remembered. The "after," then, is pure time, as distinct from the time of "before" and "now," which are really temporalized modes of spatiality and not time itself.

The content of "after" as pure time is a universal plan of action which concerns all human beings irrespective of differences, and this idea of a plan is derived from history which is seen as "a continuous process of the unfoldment of a plan of action essentially one and universal, but subject to change in detail due to

exigency of circumstances'' (56). This plan of action has its source in the ''we'' and is the basis of all love, understanding, sympathy, and charity between individuals.

Banerjee also derives all meaning from the same source. Meaning is relevant primarily to language used for indication (actions to be performed or desisted from), and indication is personal. Thus, according to him, the realm of the personal is the presupposition of all our understanding, and to know this is to be liberated from individuality and from the egoist passions that divide mankind.

Now Banerjee's concept of ''the realm of the personal'' is suggestive in so far as it is advanced as the basis of social cooperation. But he does not make as clear as one would wish how personality differs from individuality, except to suggest that persons are essential to one another and that this essentiality constitutes their reality. Besides, there seems to be a confusion between sheer egoity and individuality. There is, no doubt, a claim on us to overcome our egoistic passions and to recognize others as ends in themselves. But this does not mean relinquishing our sense of individuality, and furthermore, it is a moral claim induced by a sense of value, and to say this is different from advancing our essentiality to one another as the metaphysical first principle from which everything is to be derived. Our sense of individuality, Banerjee admits, is induced by our biological birth as distinct units in space, and yet he calls this an illusion. It is this sort of loose use of words that led linguistic analysts to claim that philosophical problems arise out of misuse of language; for how can something based on fact be an illusion?

It is not very clear how ''I with others'' differs from ''I and others,'' for even the latter can be based on the recognition of other people, each as an unique individual, and I do not see why social cooperation on this basis should not be possible. The type of cooperation Banerjee pleads for—complete understanding and perfect love—perhaps needs a type of self-forgetfulness that only religion in its finest efflorescence can provide, and only a few rise to this level. In the concept of ''we'' individuality is conquered by personality. Does the ''I'' cease to be an ''I,'' a unique being, when it is known to be integrated with others? And what precisely does this integration mean? If our separateness is completely overcome, there is no scope for talking about ''we'' in the plural, and if not, then individuals remain and achieve loving cooperation as such.

Banerjee's theory of time is highly ''speculative.'' Past and present denote only temporalized space, and pure time is just *after*

without any *before* and *now*. What is meant by pure time unrelated to all conceptions of space? Surely time can be conceived only as a relation between events, and, although an event still in the future is not yet in space, it must be projected in space in order to be conceived as a possibility. Pure time is linked by Banerjee in some curious fashion with a plan of action. But as this plan of action is got by a perusal of human history, it is not unrelated to all conception of happenings in space. I do not see how the existence of such a plan will help us to achieve liberation, since, history being in progress, such a plan is already there and liberation is nowhere in sight.

Banerjee's theory of meaning also seems to me questionable. No doubt meaning presupposes human intercourse, but it is doubtful that all meaning is to be derived from "I with others," since meaning is supposed to involve our essentiality to one another and not merely our togetherness on the human scene.

PRATIMA BOWES

UNIVERSITY OF CALCUTTA

NOTES AND NEWS

The University of Rochester and St. John Fisher College jointly commemorated the five-hundredth anniversary of the death of Nicholas of Cusa, through a series of lectures held on Friday, November 6. The papers read were: Armand A. Maurer (Pontifical Institute of Medieval Studies, Toronto), "The Philosophy of Nicholas of Cusa"; Nicholas Rescher (University of Pittsburgh), "Cusanus on the Koran: A Christian Encounter with Islam"; and Nancy S. Struever (Hobart College), "Nicholas of Cusa and Fifteenth Century Italian Humanism."

"The Logic of Science" will be the theme of a special program during the spring semester in the Philosophy of Science Center at St. John's University, New York. Guest lectures will be given by Norwood Russell Hanson (Yale University), February 19, 1965, "Problems of Theoretical Equivalence"; Wilfrid Sellars (University of Pittsburgh), March 5, "On Inference and Explanation in Science"; Michael Scriven (University of Indiana), April 9, "The Concept of Cause"; and Erwin N. Hiebert (University of Wisconsin), May 7, "Mechanical Models and Chemical Concepts in the Nineteenth Century."

The Philosophy of Science Center has also been awarded a grant by the National Science Foundation to conduct a six-week summer

Institute (July 5 to August 13) in the history and philosophy of science for college teachers. The morning sessions will deal with the history of science, and each afternoon session will deal with the philosophy of science current during the historical period treated in the morning. The program is open to college teachers of philosophy, science, and the history of science, with stipends available for forty participants. Six hours of graduate credit may be obtained.

The Department of Philosophy of Washington University, St. Louis, wishes to announce the following new (1964–65) appointments: Dr. Richard A. Watson, formerly of the University of Michigan, Assistant Professor; Dr. Bernard H. Baumrin, formerly of the University of Delaware, Assistant Professor; Dr. Jerome Schiller, Chairman, Department of Philosophy, Knox College, Visiting Lecturer; and Dr. Henry S. Leonard, Distinguished University Professor of Philosophy at Michigan State University, Visiting Professor.

The Department of Philosophy at the University of Wisconsin wishes to announce the following staff appointments for 1964–65: Paul Ziff as Professor of Philosophy; A. Phillips Griffiths, Professor of Philosophy at the University of Warwick, England, as Visiting Professor of Philosophy, Semester I; R. Ninian Smart, Professor of Philosophy at the University of Birmingham, England, as Visiting Professor of Philosophy and History, Semester II; Miss Ruby Meager, of Bedford College, London, as Visiting Lecturer, Semester II; Milton Rosenberg as Visiting Lecturer, Semester II; Jon N. Moline as Assistant Professor of Philosophy; Hans Oberdiek, Albert Snyder, Ivan Soll, and Dallas Willard as Instructors in Philosophy; and Robert M. Gordon as Lecturer in Philosophy.

The 1965 annual meeting of the American Philosophical Association, Western Division, will be held April 29–May 1, at the Edgewater Beach Hotel, Chicago, Illinois.

The Program Committee (William Hay, chairman; Edwin Allaire; Gerald Myers) welcomes papers. Unless specially arranged for a symposium, a paper may not take over 20 minutes to read, but a fuller version with the reading version may be submitted. Three copies plus an abstract of under 300 words must be sent before January 15, 1965, to Prof. Gerald Myers, secretary, Kenyon College, Gambier, Ohio. Abstracts of accepted papers will be printed in the *Program of the Annual Meeting*.

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